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§ 31. **Grape Vines.**—The American Naturalist, Vol. VI. pp. 532, seqq. republished Mr. Riley's Report (1872) to the State of Missouri on the Phylloxera, the insect that has proved so injurious to the vine. This paper contained Dr. Engelmann's Synopsis of the True Grape Vines of the Old United States together with a list of the nine species to be found in our territory. The Bulletin, Vol. V. No. 1, contained Regel's revision of the species, with a mention of his opinion that *Vitis vinifera* is a hybrid between *V. Labrusca* and *V. vulpina.* The *Grape Manual* of the *Bushberg Catalogue*, of which we have received, pp. 1-16, with a few emendations by Dr. Engelmann, contains the fullest account that we have seen of that eminent botanist's views on this subject. We add a very brief summary of the paper, recommending all interested, whether botanists or cultivators, to procure a copy of the "Manual."

It is not true that the European vines do not produce sterile plants in the same manner as the American. In *Vitis Labrusca*, as first indicated by Braun, the tendrils (or their equivalent, an inflorescence) are found opposite each leaf, *i. e.*, *continuous.* All the other species exhibit a regular alternation of two leaves, each having a tendril opposite it, with a third leaf without such a tendril, and this arrangement may be named *intermittent tendrils.* To observe this character well it is necessary to examine well-grown canes found in early summer. In connection with this law most grape-vines bear only two inflorescences or bunches upon the same cane, while in the forms belonging to *Labrusca* there are often three, and sometimes four or five, or, rarely, even six in succession each opposite a leaf.

Only the leaves of flower-bearing canes ought to be considered the normal ones. The dull leaves, even when they lose their down, never become glossy like the shining ones. The different forms of *Riparia* and *Cordifolia* flower first, next comes *Labrusca* and its relatives (cultivated) and about two weeks later than *Riparia* comes *Æstivalis*—the limits at St. Louis varying with the season, being between May 10th and June 15th.

One of the botanical characters of the grape-vines is found in the seeds. The bunches may be larger or smaller, looser or more compact, branched (shouldered) or more simple ; the berries may be larger or smaller, of different color or consistency, and contain fewer or more seeds (never more than four) ; but the seeds, though to some extent variable, especially on account of their number and mutual pressure where more than one is present, exhibit some available differences. The big top of the seed is convex or rounded, or it is more or less deeply notched. The thin lower end of the seed, the beak, is short and abrupt, or it is more or less elongated. On the inner (ventral) side are two shallow longitudinal depressions. Between them is a ridge, slight where there are one or two seeds, or sharper where the seeds are in threes or fours; along this ridge the *raphe* (the attached funiculus or cord) runs from the *hilum*, at the beak, over the top of the seed, and ends on its back in an oval or circular well-marked spot, called by botanists *chalaza.* This raphe is on that ridge represented by a slender thread, which on the top and back of the seed is entirely indistinct, or scarcely perceptible, or it is more or less prominent like a thread. In our American species these characters seem pretty trustworthy. There are given cuts of grape-seeds to illustrate the different characters. *V. æstivalis* has the raphe and more or less circular chalaza strongly developed. *V. riparia* has the seeds obtuse, or very slightly depressed on top, chalaza rather flat, elongated, and gradually lost in a groove which encloses the scarcely prominent raphe. *V. cordifola* is similar, but the raphe is usually more prominent, and nearer to that of *V. æstivalis.* *V. Labrusca* has the seeds large and notched, rather flat chalaza and no raphe seen in the groove which extends from the chalaza to the notch. *V. vulpina* has a very distinct seed, flatter, with straighter sides, wrinkled on both surfaces, notched on top, narrow chalaza, and no visible raphe. The seeds of European vines are easily distinguished from all American grape-seeds by the narrower and usually longer beak, and especially by the large, though not very prominent chalaza, which occupies the upper and not the middle part of the seed.

Dr. Engelmann does not favor Regel's attempt to unite our species with those of the old world. *V. vinifera* finds its place between *V. riparia* and *V. æstivalis.* It belongs to the earliest acquisitions of cultivation. Not only have the sepulchres of the mummies of ancient Egypt preserved us its fruit (large-sized berries) and seed, but its seeds have even been discovered in the lacustrian habitations of Northern Italy. Its native country is a question. Regel's theory has been given in the place quoted. Prof. Braun of Berlin suggests that the different varieties are the offspring of distinct species yet found wild in many parts of Southern Europe and Asia, which thus he considers not the accidental offspring of the cultivated plants, as is generally believed, but the original parent stock. Dr. Engelmann adds from his own investigations that the grape-vine which inhabits the native forests of the "bottom lands" of the Danube well represents our *V. cordifolia* and *V. riparia*, while the wild grape of the hilly countries of Tuscany and Rome reminds him of *V. æstivalis.* The latter was known to the ancients as *Labrusca*, a name improperly applied by science to the American species, and is called by the natives to this day *Brusca.* The grape-vines of the countries south of the Caucasus mountains, the ancient Colchis, the reputed original home of these plants, greatly resemble the Italian plant just described.

The number of true grape-vines in the present territory of the United States, considered good species, is limited to nine, of which we copy the description. It will be seen that the first four species are more or less glabrous, the next four more or less woolly or cottony, the ninth again glabrous. The first six have smaller berries, the others larger ones.

1. *Grape-vines with loose shreddy bark, climbing by the aid of branched tendrils, or (in No. 1) without tendrils and not climbing at all.*

a. Berries small, 3-6 or rarely 7 lines in diameter, (in No. 7 larger,) seeds more or less rounded on the top, with the raphe often more or less prominent on the top and back, or inconspicuous. All the species of this group have (on well grown shoots) intermittent tendrils.

1. **V. rupestris,** Scheele. Bush Grape or Sand Grape.—A small bushy plant, often without any tendrils, rarely somewhat climbing; leaves small (2-3 inches wide) and often folded, mostly broader than long, heart-shape or truncate at base, scarcely ever slightly lobed, with broad coarse teeth and usually an abruptly elongated point, glabrous, and of a glaucous or light green color; berries middle sized, in very small bunches; seeds mostly 3-4, round, with an extremely short beak, obtuse, with a small chalaza; raphe very slender or invisible. Missouri to Texas and probably New Mexico. In Missouri and Arkansas it grows on the gravelly banks and overflowed bars of mountain streams; in Texas also on rocky plains, whence the Latin name. Its luscious fruit ripens in Missouri in August. Not cultivated.

2. **V. cordifolia,** Mchx. Winter, Frost, or Chicken Grape.—Tall (or more rarely low), climbing by the aid of intermitting branched tendrils, trunks often 6-9 inches in diameter, with loose shreddy bark. Leaves middle-sized or small (2½-3 or 4 inches in diameter), *round-heart shaped*, or truncate at base, mostly entire or very slightly tri-lobed on the edges, with broad shallow teeth, usually smooth and shining, more on the upper than on the lower side; the young ones sometimes, and very rarely the old ones, with short hair on the ribs below; panicles compound, large and loose; berries among the smallest, in large mostly loose bunches, black, without a bloom and without tough pulp; maturing late in the fall, usually with a single short and thick seed, marked by a more or less prominent raphe. New England to Texas and westward to the limits of the wooded part of the Mississippi valley. The flowers, principally the sterile (male), are especially fragrant. Not cultivated.

3. **V. riparia,** Mchx. Riverside Grape.—Similar to the last, but usually a smaller plant, with larger (3–5 inches in diameter) and more or less incisely 3-lobed, glabrous, shining (or rarely, when young, slightly hairy) leaves, the lobes long and pointed, the teeth also more pointed than in *V. cordifolia*; panicles rather small and compact; *berries* usually larger than in the last, mostly with a bloom, in smaller and often more compact bunches, without pulp, commonly 1 or 2-seeded; seeds obtuse, or sometimes very slightly depressed, with the raphe often almost obliterated. As far to the south as the last, and much farther north and west. It is the only grape-vine in Lower Canada, being found even 60 miles north of Quebec, and the only one on the eastern slope of the Rocky Mountains. The northern form, in Canada, northern New York to Michigan and Nebraska, has fewer and larger berries in a bunch and is easily distinguished from *V. cordifolia.* The south-western form, however, a taller plant, with smaller black berries, approaches more closely to this last species. The fruit ripens earlier and is much pleasanter. Cultivated.

4. **V. Arizonica,** Englmn. Arizona Grape.—Similar to *V. Californica*, but tomentose only when young, later glabrous, with middle-sized berries, reported to be of luscious taste.

5. **V. Californica.** Bentham. California Grape.—The only wild grape of California, has rounded, downy leaves, and small berries, and is not made use of as far as known. The seeds are obtuse, with a short beak, elongated chalaza, and very slender raphe.

6. **V. æstivalis,** Mchx. Summer Grape.—Climbing over bushes and small trees, by the aid of forked, intermittent tendrils; leaves large (4–5 or six inches wide), of firm texture, entire or often more or less deeply and obtusely 3–5 lobed, with rounded sinus, and with short and broad teeth; when young, always very woolly or cottony, mostly bright red or rusty; at last smoothish, but dull, and never shining like *V. riparia*; berries usually larger than in this species, coated with a distinct bloom, and, when well grown, in compact bunches; *seeds*, usually 2 or 3, rounded on top, with a very prominent raphe. Throughout the Middle and Southern States. Var. *Lincecumii*, Post Oak Grape of the sandy soils of Louisiana and Texas, more bushy than climbing, with deeply lobed, rusty, downy leaves and sweet fruit. Var. *monticola*, Mountain Grape of Texas, with small entire leaves (the down of which at last is gathered in little tufts) and large acidulous berries. Var. *cinerea*, with ashy white, downy, scarcely-lobed leaves, with fruit like the last variety. It is not always easy to distinguish such varieties from the other species, unless the essential characters above enumerated be closely attended to, and the numberless gradual transitions from one form to the other be watched. Cultivated.

7. **V. candicans,** Englmn. Mustang Grape, of Texas.—A tall climber, with rather large, rounded, almost toothless leaves, white cottony on the under side, bearing large berries, which, like those of the wild *Labrusca*, show different colors, greenish, claret, and bluish-black; and which, in its native country, are made into wine. In young shoots and sprouts the leaves are usually deeply and elegantly many-lobed.

b. Berries large, 7-9 or even 10 lines in diameter; raphe scarcely visible on the moe or less deeply-notched top of the seed; tendrils continuous.

8. **V. Labrusca,** L. Northern Fox Grape.—Plant usually not large, stems with loose, shreddy bark, climbing over bushes or small trees, though occasionally reaching the tops of the highest trees. Tendrils continuous, branched. *Leaves* (4–6 inches wide) large and thick, entire, or sometimes deeply lobed, very slightly dentate, coated, when young, with a thick, rusty, or sometimes whitish, wool or down, which, in the wild plants, remains on the lower side, but almost always disappears in the mature leaf of some cultivated varieties; *berries* large, in middle-sized, or, in some cultivated varieties, rather large bunches, bearing two or three, or sometimes four seeds. New England to South Carolina, where it prefers wet thickets; it extends into the Alleghany Mountains, and here and there even down their western declivities, but it is a stranger to the Mississippi

Valley. By far the largest number of varieties of grape-vines now cultivated in our country are the offspring of this species—a few produced by nursery men, but most of them picked up in the woods.

II. Grape-vines with (on the younger branches) firmly adhering bark, which only in the older stems scales off; aerial roots from inclined trunks in damp localities; tendrils intermittent, simple; berries very large (7–10 lines thick), very few in a bunch, easily detaching themselves at maturity; seeds with transverse wrinkles or shallow grooves on both sides.

9. **V. vulpina, L.** Southern Fox Grape, or Muscadine.—Low, or often climbing very high, with small (2, or, at most, 3 inches wide), rounded heart-shaped, firm and glossy dark green leaves, smooth, or rarely slightly hairy on the under side, with coarse and large, or broad and bluntish teeth. South from Maryland, Kentucky and Arkansas. Cultivated, especially the white *Scuppernong* variety.

§ 32. **Club Investigations.**—There have been three subjects proposed for investigation by the Club this year, viz.: 1. The plants that have a tendency to be evergreen in our climate, or to keep their leaves in whole or in part on into the winter. 2. The plants which conceal or protect the leaf-bud within the base of the petiole. 3. Carnivorous plants; it is conjectured that examination will disclose a number of plants that seem intended to do insects to death, Catchflies and Robinia viscosa for example. The chairmen of the committees are respectively E. S. Miller, of Wading River, Long Island, G. M. Wilber and W. H. Leggett, who may be addressed at 224, E. 10th St., New York. Communications on these subjects will be welcomed by the committees.

§ 33. ADDITIONS AND CORRECTIONS FOR BOTANICAL DIRECTORY.

Clarke, Miss Cora H., Box 108, Jamaica Plain, Mass.
Farlow, Prof, Wm. G., Botanic Garden, Cambridge, Mass.
Febiger, Christian, Wilmington, New Castle Co., Del. *Microscopic Algæ. Spec. Diatomaceæ.*
Forney, D. S., Allisonia, Pulaski Co., Va.
Friese, V., Fort Defiance, New Mexico.
Garber, Dr. A. P., Columbia, Lancaster Co., Pa.
Greene, Rev. E. L., Georgetown, Col.
Hervey, Rev. A. B., 10, N. Second St., Troy, N. Y. *Algæ Ex.*
Hyamus, M. E., Statesville, Indell Co., N. C. *Ex.*
Klippart, John H., Columbus, Ohio.
Loomis, Miss H. A., Oakland, Cal. *Ex.*
Mathews, Mrs. Maria D., Painesville, Ohio,
Merriam, Jas. S., 61 Liberty St., New York,
Morong, Rev. Thos, Ipswich, Mass.
Nevius, Rev. R. D., Baker City, Oregon.
Prescott, Miss Lucinda T., Painesville, Ohio.
Ridgway, Robert, Mt. Carmel, Ill.
Schneck, Dr. J., Mt. Carmel, Ill.
Shriver, Howard, Wytheville, Wythe Co., Va.
Tallichet, H., Wilmington, N. C. *Living Dionæa and other insectivorous plants.*
Watson, Sereno, Cambridge, Mass. *Omit Spec. Western.*
Wheeler, Chas. F., Hubbardston, Ionia Co., Mich. *Ex.*
Wibbe, Rev. H., St. Peter's Church, Oswego, N. Y. *Ex.*

§ 34. **New Musci**, by C. F. AUSTIN.

1. **Ephemerum (Micrometrium) Jamesii.** *n. sp.*—Plantæ minutissimæ, in prothallio byssoideo sparso persistente nidulantes, fere acaules, foliis erectis angustissimis lineali-subulatis attenuatis laxe textis serrato dentatis nervo indistincte superne notatis; capsula inclusa minutissime globosa indistinctissime apiculata clausa in vaginulam breviter ovalem sessili cum pedicello minutissimo nigro decidua, calyptra concentrica stylidiformi (basi vix expansa) crassiuscula vix $\frac{1}{700}$ unc. longa apice infundibuliformi, sporis minutis